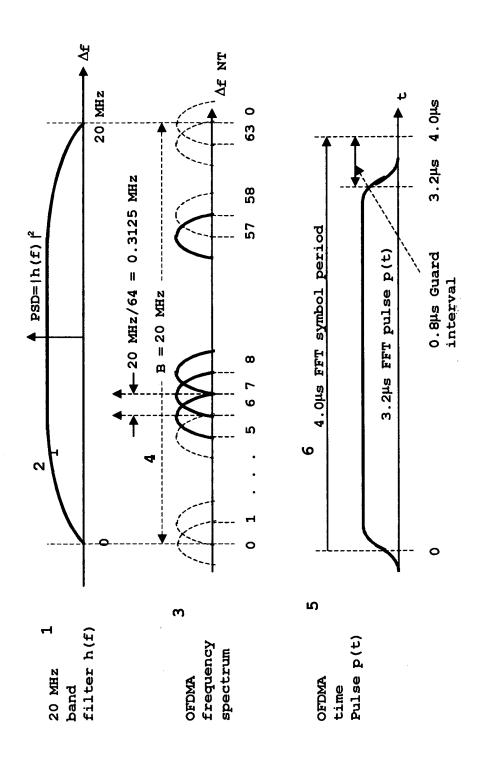
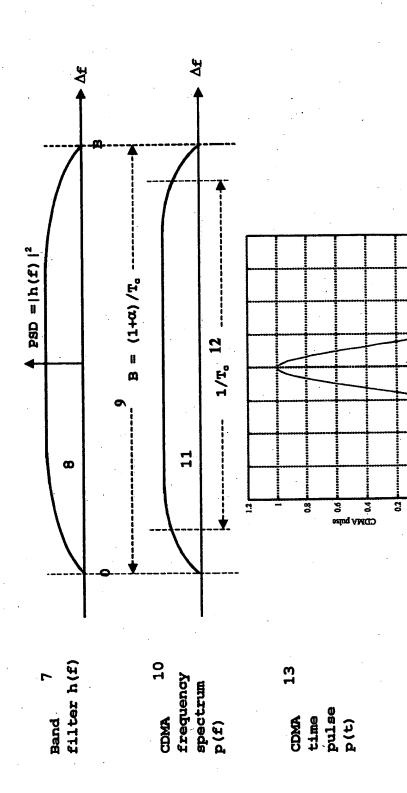
Prior Art: OFDMA wadeform FIG. 1



chip\_5GHz\_3

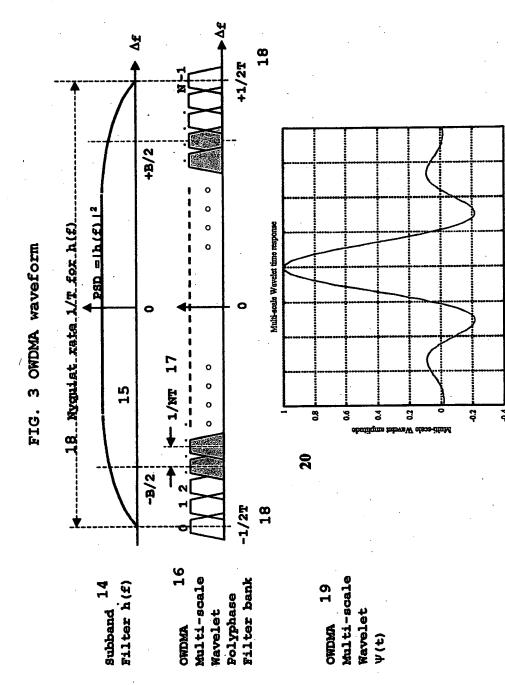
FIG. 2 Prior Art: CDMA waveform



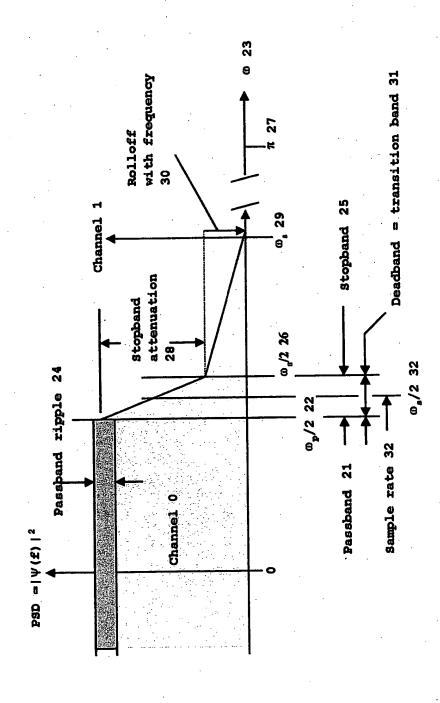
Time offset in chips, t/NT

# REPLACEMENT SHEET

) [] []



Wavelet PSD= $|\psi(f)|^2$  requirements for communications



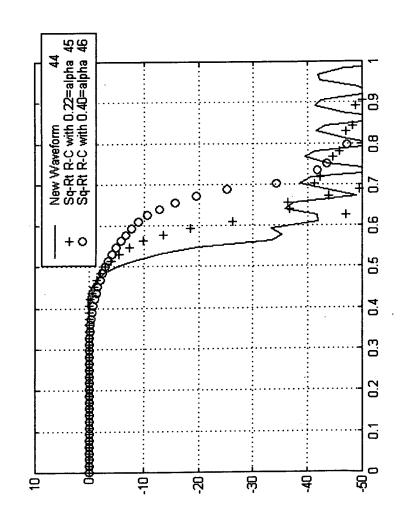
43

symbol rate

Normalized frequency,

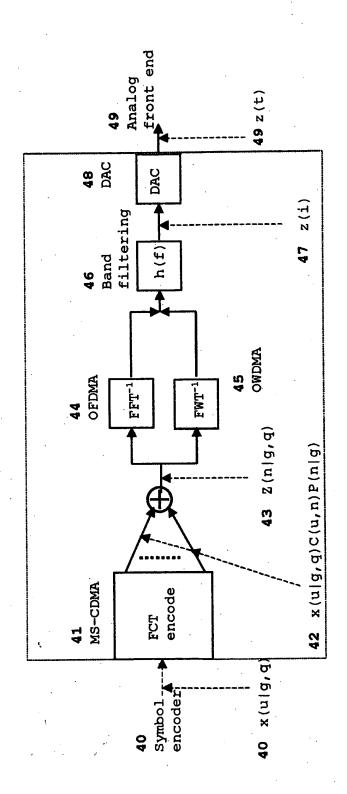
# REPLACEMENT SHEET

and PSD for New Waveform (Wavelet waveform) Square-Root Raised Cosine (Sq-Rt R-C) ស FIG.



Power spectral density PSD, dB 42

MS-CDMA OFDMA/OWDMA Encoding for Transmitter ဖ FIG.



Block Diagram FIG. 7A M8-CDMA OFDMA/OWDMA Transmitter:

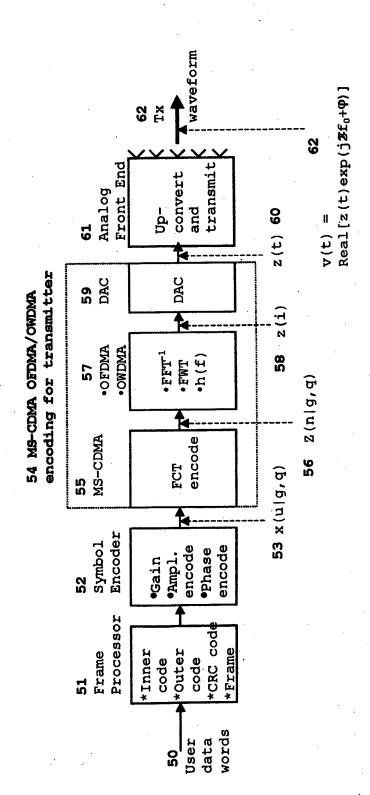
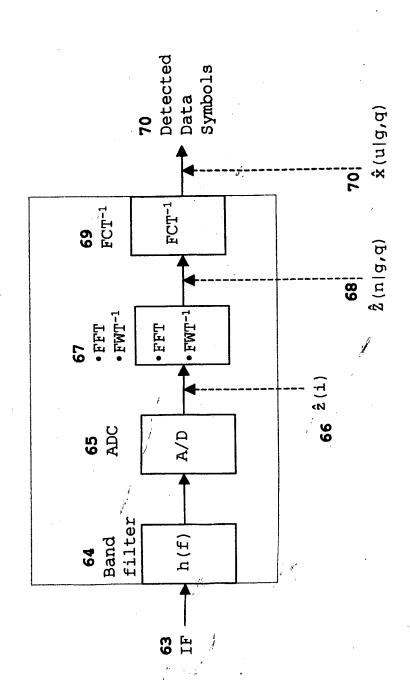


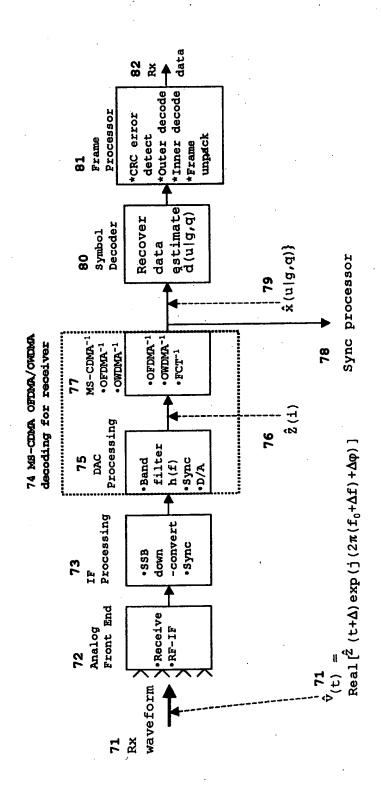
FIG. 7B MS-CDMA OFDMA/OWDMA Transmitter: MS-CDMA Mapping

Tx Antennas 156 Beams 155 . .,  $N_1\!-\!1$  over subbands within frequency band frequency 153 .,  $N_4{\hspace{-0.05cm}\text{--}\hspace{-0.05cm}1}$  over beams of transmit antenna  $n_0 \! = \! 0, 1, 2, \ldots$  .,  $N_0 \! - \! 1$  over chips within each channel  $Tx n_5=0$ .,  $N_5\!-\!1$  over transmit antennas .,  $N_2 - 1 \ \text{over frequency bands}$ .,  $N_3-1$  over data blocks n₀ Chips 152 ---Bands 153 154 Subbands  $\ddot{n}_1$ MS-Mapping Example 150  $n_2 = 0, 1, 2, .$  $n_1 = 0, 1, 2, .$  $n_5 = 0, 1, 2, .$  $n_2=0$  $n_3 = 0, 1, 2, .$ 151

MS-CDMA OFDMA/OWDMA Decoding for Receiver FIG. 8



9 MS-CDMA OFDMA/OWDMA Receiver Block Diagram FIG.



. 4)